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Serial Adapter Module
Supplement

NORTEL NETWORKS™

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European Requirements Only

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Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung: Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention: Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l’utilisateur de prendre les mesures spécifiques appropriées.

EC Declaration of Conformity

This product conforms (or these products conform) to the provisions of Council Directive 89/336/EEC and 73/23/EEC.

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Canadian Department of Communications Radio Interference Regulations

This digital apparatus (Serial Adapter Module) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (Serial Adapter Module) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Canada CS-03 Rules and Regulations

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Canada Requirements Only *(continued)*

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: For equipment using loopstart lines, please note that the Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5. The REN is located on the “FCC Rules Part 68” label located on the bracket of the module, or on the back of the unit.

Canada CS-03 -- Règles et règlements

Avis: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: Veuillez prendre note que pour tout appareillage supportant des lignes de type “loopstart,” l'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5. Le REN figure sur l’étiquette “FCC Rules Part 68” située sur le support du module ou à l’arrière de l’unité.

FCC Part 68 Compliance Statement

This equipment complies with Part 68 of FCC Rules. All direct connections to telephone network lines must be made using standard plugs and jacks compliant with FCC Part 68. Please note the following:

1. You are required to request service from the telephone company before you connect the unit to a network. When you request service, you must provide the telephone company with the following data:
   - When you request T1 Service, you must provide the telephone company with
     -- The Facility Interface Code

        Provide the telephone company with all the codes below:

        - 04DU9-BN (1.544 MB, D4 framing format)
        - 04DU9-DN (1.544 MB, D4 framing format with B8ZF coding)
        - 04DU9-1KN (1.544 MB, ESF framing format)
        - 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
        - 04DU9-1ZN (1.544 MB, ANSI ESF and ZBTSI without line power)

        The telephone company will select the code it has available.

     -- The Service Order Code(s) (SOC): 6.0F

     -- The required Universal Service Order Code (USOC) jack: RJ48C
   - When you request Primary Rate ISDN Service, you must provide the telephone company with
     -- The Facility Interface Code: 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)

     -- The Service Order Code(s) (SOC): 6.0F

     -- The required Universal Service Order Code (USOC) jack: RJ48C
2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If the unit causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the unit, please contact the Nortel Networks Technical Solutions Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Nortel Networks.

United States	1-800-2LANWAN
Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5740-1700

5. You are required to notify the telephone company when you disconnect the unit from the network.

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Preface

The Serial Adapter Module provides connectivity for V.35, RS-232, RS-449/422 balanced, RS-530, and X.21 devices.

Before You Begin

This guide is intended for qualified service personnel who are installing the Serial Adapter Module in an AN®/ANH™, Passport® ARN™, Passport 5430, or Passport 2430 for the first time or who need to install or replace any customer-replaceable unit (CRU). A qualified service person should have appropriate technical training and experience and be aware of the hazards involved in installing and replacing CRUs.

How to Use This Supplement

This WAN adapter module can be used with several different platforms. Refer to the table below to find the chapter that contains the information appropriate for the platform you are using.

Platform	**Refer to**
AN or ANH	Chapter 1
Passport ARN	Chapter 2
Passport 5430	Chapter 3
Passport 2430	Chapter 4

Text Conventions

This guide uses the following text conventions:

bold text	Indicates command names and options and text that you need to enter. Example: Enter the **diags** command.
italic text	Indicates new terms, book titles, and variables in command syntax descriptions.

Acronyms

This guide uses the following acronyms:

BRI	basic rate interface
CRU	customer-replaceable unit
ESD	electrostatic discharge
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LED	light-emitting diode
PROM	programmable read-only memory
RSL	received line signal detection
WAN	wide area network

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If you purchased a Nortel Networks service program, contact one of the following Nortel Networks Technical Solutions Centers:

Technical Solutions Center	Telephone
EMEA	(33) (4) 92-966-968
North America	(800) 2LANWAN or (800) 252-6926
Asia Pacific	(61) (2) 9927-8800
China	(800) 810-5000

An Express Routing Code (ERC) is available for many Nortel Networks products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate an ERC for your product or service, go to the www12.nortelnetworks.com/ URL and click ERC at the bottom of the page.

Chapter 1
Using the Serial Adapter Module in an AN or an ANH Router

This chapter supplements *Installing an Adapter Module in an AN or ANH Router.* Follow the hardware installation steps in that manual, then refer to this document for information specific to the serial adapter module.

Verifying AN/ANH Router Requirements

Table 1-1 shows the minimum versions of boot and diagnostic programmable read-only memory (PROM) code required for a serial adapter module.

Table 1-1. PROM Diagnostic and Boot Code for AN/ANH Routers

Code Type	Minimum Version	Directory	File Name
Boot	8.12	*an_proms*	*anboot.exe*
Diagnostic	5.31	*an_proms*	*andiag.exe*

For information on upgrading PROM, see the BayRS™ *Upgrading Routers* guide.

Attaching Cables

Connect the communications cable to the 44-pin DSUB connector on the installed adapter module.

You install the serial adapter module in an open adapter module slot on the router, as follows:

- AN or 12-port ANH -- the back-panel adapter module slot (Figure 1-1). See *Installing an Adapter Module in an AN or ANH Router.*
- 8-port ANH -- the back-panel COM3 slot (Figure 1-2). See *Installing an Adapter Module in an AN or ANH Router.*

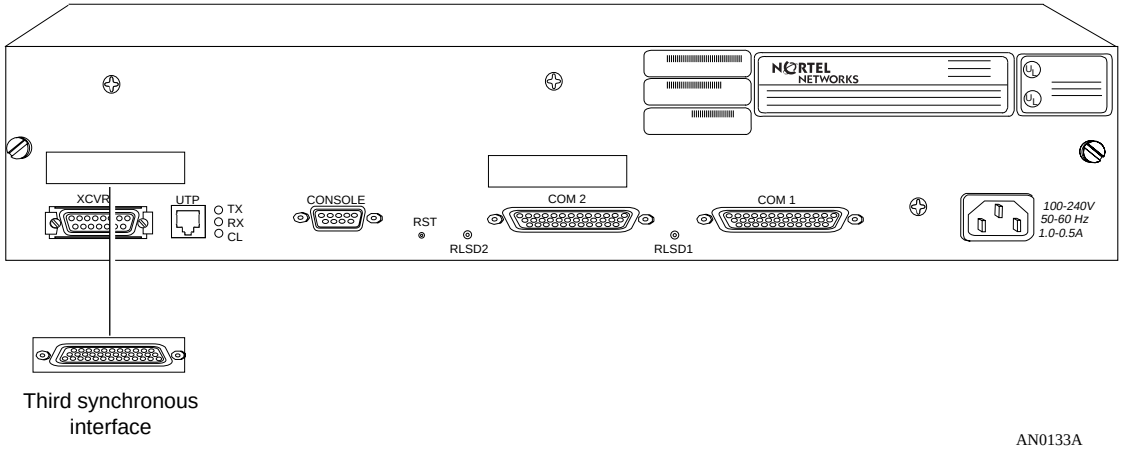

Figure 1-1. Serial Adapter Module Connector on an AN or 12-Port ANH

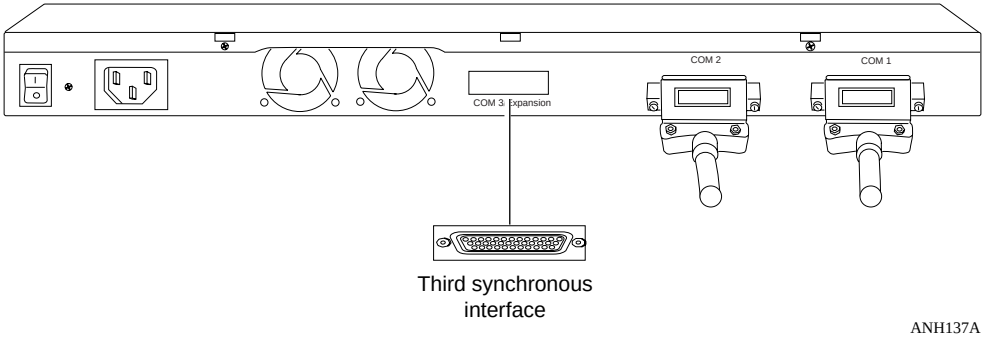

Figure 1-2. Serial Adapter Module Connector on an 8-Port ANH

Completing Software Configuration

Once you have successfully installed the serial adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the AN or ANH to the network.	• *Installing and Operating AN and ANH Routers*
Modify the configuration file to add the serial adapter module and enable default software services.	Any of the following: • *Configuring and Managing Routers with Site Manager* • *Using the Bay Command Console (BCC)*
Configure line services.	*Configuring WAN Line Services*
Configure WAN protocol services.	Any of the BayRS WAN or System Suite guides, including: • *Configuring IP Services* • *Configuring Frame Relay Services* • *Configuring X.25 Services* • *Configuring PPP Services*

For the latest information, be sure to review the release notes and documentation change notice for your version of BayRS software.

Interpreting LEDs

The serial adapter module RLSD (Received Line Signal Detection) LED (Figure 1-3) lights when the serial interface detects data transfer.

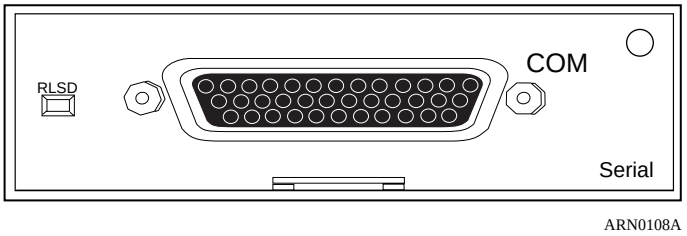

Figure 1-3. Serial Adapter Module RLSD LED

Note: The LED will blink on and off during diagnostic testing, but does not indicate data transfer until you have configured and enabled the software services.

Chapter 2
Using the Serial Adapter Module in a Passport ARN Router

This chapter supplements *Installing and Operating Passport ARN Routers* (Chapter 4, “Installing a WAN Adapter Module”). Follow the hardware installation steps in that manual, then refer to this document for information specific to the serial adapter module.

Verifying ARN Router Requirements

Table 2-1 shows the minimum versions of boot and diagnostic programmable read-only memory (PROM) code required for a serial adapter module.

Table 2-1. PROM Diagnostic and Boot Code for ARN Routers

Code Type	Minimum Version	Directory	File Name
Boot	1.17	*arn_proms*	*arnboot.exe*
Diagnostic	1.30	*arn_proms*	*arndiag.exe*

For information on upgrading PROM, see the BayRS™ *Upgrading Routers* guide.

Attaching Cables

Connect the communications cable to the 44-pin DSUB connector on the installed adapter module.

You install the serial adapter module in one of the two front-panel WAN adapter module slots (Figure 2-1).

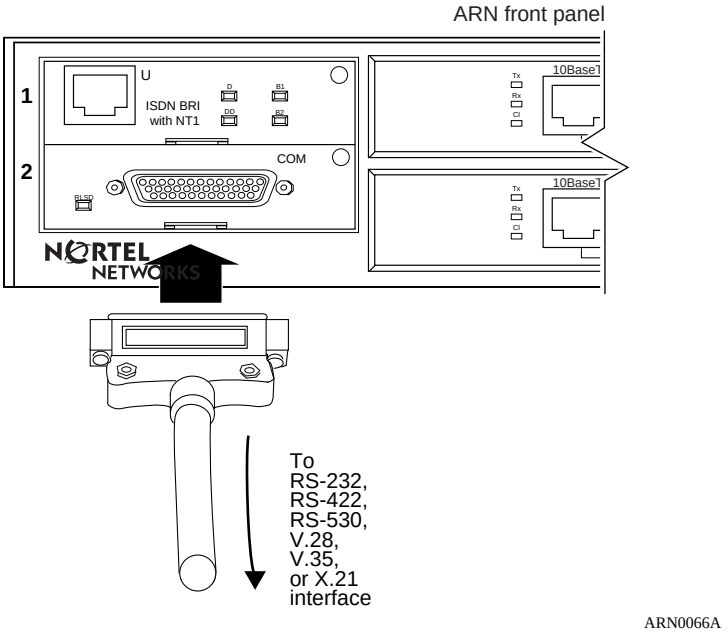

Figure 2-1. ARN Serial Adapter Module Connector (Slot 2)

Completing Software Configuration

Once you have successfully installed the serial adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the ARN to the network.	One of the following: • *Installing and Operating Passport ARN Routers* • *Configuring Remote Access for AN and ANH Routers*
Modify the configuration file to add the serial adapter module and enable default software services.	Any of the following: • *Configuring and Managing Routers with Site Manager* • *Using the Bay Command Console (BCC)*
Configure line services.	*Configuring WAN Line Services*
Configure WAN protocol services.	Any of the BayRS WAN or System Suite guides, including: • *Configuring IP Services* • *Configuring Frame Relay Services* • *Configuring X.25 Services* • *Configuring PPP Services*

For the latest information, be sure to review the release notes and documentation change notice for your version of BayRS software.

Interpreting LEDs

The serial adapter module RLSD (Received Line Signal Detection) LED (Figure 2-2) lights when the serial interface detects data transfer.

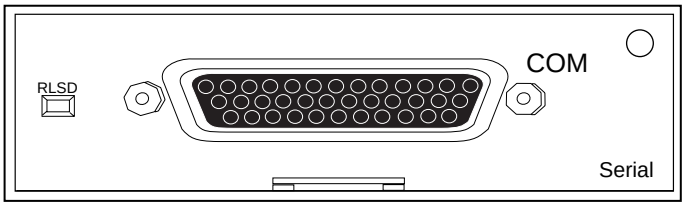

Figure 2-2. Serial Adapter Module RLSD LED

Note: The LED will blink on and off during diagnostic testing, but does not indicate data transfer until you have configured and enabled the software services.

Chapter 3
Using the Serial Adapter Module in a Passport 5430 Multiservice Access Switch

This chapter supplements *Installing and Operating the Passport 5430 Multiservice Access Switch* (Chapter 10, “Installing a WAN Adapter Module”). Follow the hardware installation steps in that manual, then refer to this document for information specific to the serial adapter module.

WAN Adapter Module Placement Considerations

When installing WAN adapter modules in the Passport 5430 Module slots, note the following:

- Each WAN adapter module you install is automatically assigned a circuit, even if the WAN adapter module has not been configured. This prevents disruption of active circuits if you reconfigure the the module at a later time.
- ISDN BRI adapter modules can use two circuits (one for each of the 2 B channels).
- You can configure a total of 4 circuits.
- Circuit allocations are prioritized according to which Module slot is being used by the WAN adapter modules. Module slot 3 has priority over Module slot 4, and Module slot 4 has priority over Module slot 5.
- When there are more than the 4 possible circuits to be configured, for example if there are 2 ISDN BRI adapter modules and a serial adapter module (5 circuits in all), circuit allocation becomes an issue.

In the example above, the first ISDN BRI module (in Module slot 3) has the resources to bring up a second B channel (thus using 2 circuits). The serial adapter in Module slot 4 uses a third circuit. The second ISDN BRI adapter module (in Module slot 5), can have only 1 B channel configured because the serial adapter module (in Module slot 4) has priority and is allocated a circuit over anything in Module slot 5. In this case, there are not enough circuits left to utilize the second B channel on the ISDN BRI adapter in Module slot 5. In this example, if you wanted to have both B channels on both ISDN BRI adapters configured, you would have to remove the serial card from Module slot 4.

Table 3-1 lists examples of valid WAN adapter module combinations.

Table 3-1. Example WAN Adapter Module Combinations

Module 3	Module 4	Module 5
T1/FT1 or E1/FE1	T1/FT1 or E1/FE1	T1/FT1 or E1/FE1
T1/FT1 or E1/FE1	T1/FT1 or E1/FE1	Serial or V.34 modem
T1/FT1 or E1/FE1	Serial or V.34 modem	Serial or V.34 modem
T1/FT1 or E1/FE1	T1/FT1 or E1/FE1	ISDN 2 B-channels plus 1 D-channel
T1/FT1 or E1/FE1	ISDN BRI 1 B-channel plus 1 D-channel	Serial or V.34 modem
T1/FT1 or E1/FE1	Serial or V.34 modem	Serial or V.34 modem
Serial or V.34 modem	Serial or V.34 modem	Serial or V.34 modem
Serial or V.34 modem	Serial or V.34 modem	ISDN BRI 1 B-channel plus 1 D-channel
Serial or V.34 modem	Serial or V.34 modem	ISDN BRI 2 B-channels plus 1 D-channel
Serial or V.34 modem	ISDN BRI 2 B-channels plus 1 D-channel	ISDN BRI 1 B-channel plus 1 D-channel
ISDN BRI 2 B-channels plus 1 D-channel	ISDN BRI 2 B-channels plus 1 D-channel	Empty
ISDN BRI 2 B-channels plus 1 D-channel	ISDN BRI 1 B-channel plus 1 D-channel	Serial or V.34 modem

(continued)

Table 3-1. Example WAN Adapter Module Combinations (continued)

Module 3	Module 4	Module 5
ISDN BRI 2 B-channels plus 1 D-channel	ISDN BRI 1 B-channel plus 1 D-channel	T1/FT1 or E1/FE1
ISDN BRI 2 B-channels plus 1 D-channel	Serial or V.34 modem	ISDN BRI 1 B-channel plus 1 D-channel
ISDN BRI 2 B-channels plus 1 D-channel	T1/FT1 or E1/FE1	ISDN BRI 1 B-channel plus 1 D-channel

Attaching Cables

Connect the communications cable to the 44-pin DSUB connector on the installed adapter module.

You install the serial adapter module in one of the three front-panel Module slots on the Passport 5430 (Figure 3-1).

Note: The slot labeled Remote Console is reserved for the V.34 modem adapter module. Do not install the serial adapter module in the Remote Console slot.

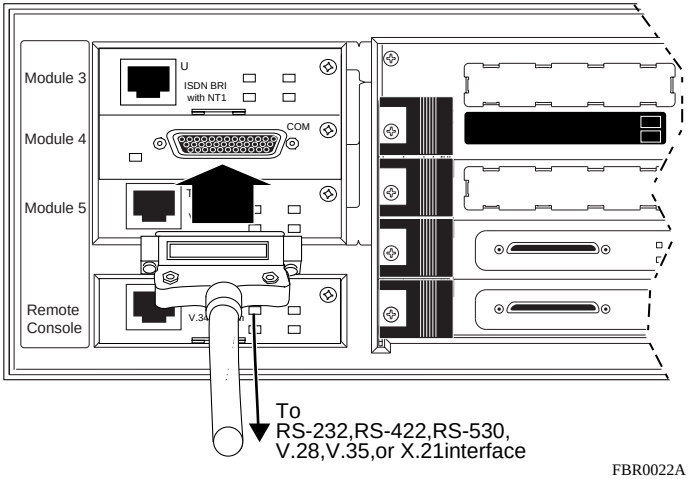

Figure 3-1. Passport 5430 Serial Adapter Module Connector

Completing Software Configuration

Once you have successfully installed the serial adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	**Location of Instructions**
Modify the Passport 5430 configuration file to add the serial adapter module and enable default software services.	Any of the following: • *Configuring and Managing Routers with Site Manager* • *Using the Bay Command Console (BCC)*
Configure line services.	*Configuring WAN Line Services*
Configure WAN protocol services.	Any of the BayRS WAN or System Suite guides, including: • *Configuring IP Services* • *Configuring Frame Relay Services* • *Configuring X.25 Services* • *Configuring PPP Services*

For the latest information, be sure to review the release notes and documentation change notice for your version of BayRS software.

Interpreting LEDs

The serial adapter module RLSD (Received Line Signal Detection) LED (Figure 3-2) lights when the serial interface detects data transfer.

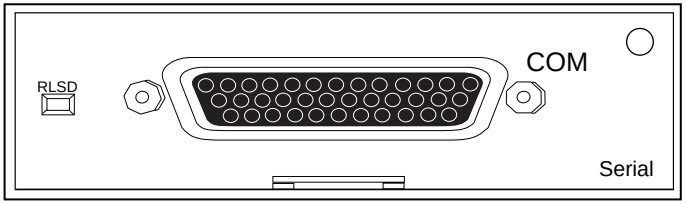

Figure 3-2. Serial Adapter Module RLSD LED

Note: The LED will blink on and off during diagnostic testing, but does not indicate data transfer until you have configured and enabled the software services.

Chapter 4
Using the Serial Adapter Module in a Passport 2430 Multiservice Access Switch

This chapter supplements *Installing and Operating the Passport 2430 Multiservice Access Switch*. Follow the hardware installation steps in that manual, then refer to this document for information specific to the serial adapter module.

Attaching Cables

Connect the communications cable to the 44-pin DSUB connector on the installed adapter module.

You install the serial adapter module in one of the WAN adapter module slots on the Passport 2430 (Figure 4-1).

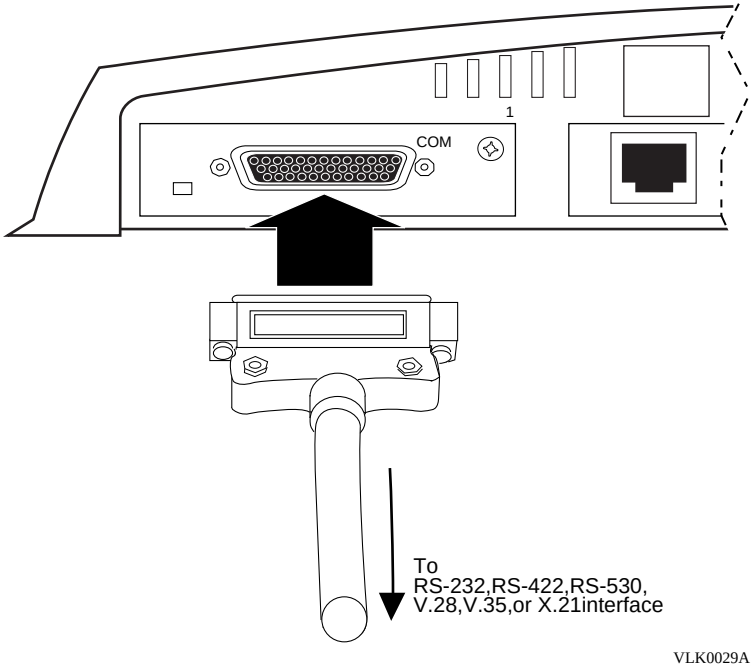

Figure 4-1. Passport 2430 Serial Adapter Module Connector

Completing Software Configuration

Once you have successfully installed the serial adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the Passport 2430 to the network.	• *Installing and Operating the Passport 2430 Multiservice Access Switch*
Modify the configuration file to add the serial adapter module and enable default software services.	One of the following: • *Configuring and Managing Routers with Site Manager* • *Using the Bay Command Console (BCC)*
Configure line services.	*Configuring WAN Line Services*
Configure WAN protocol services.	Any of the BayRS WAN or System Suite guides, including: • *Configuring IP Services* • *Configuring Frame Relay Services* • *Configuring X.25 Services* • *Configuring PPP Services*

For the latest information, be sure to review the release notes and documentation change notice for your version of BayRS software.

Interpreting LEDs

The serial adapter module RLSD (Received Line Signal Detection) LED (Figure 4-2) lights when the serial interface detects data transfer.

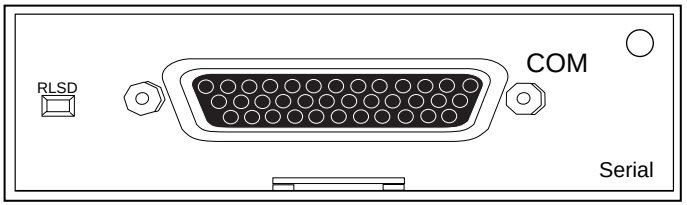

Figure 4-2. Serial Adapter Module RLSD LED

Note: The LED will blink on and off during diagnostic testing, but does not indicate data transfer until you have configured and enabled the software services.